OWNER'S MANUAL

Directed®

Model 650

CONGRATULATIONS

Thank you for choosing a Directed Audio power amplifier. Directed has been the leader in high-quality and innovative security products in the U.S. since 1990. Now we introduce to the car audio industry the same winning formula - products that meet the stringent standards of today's mobile electronics enthusiast yet priced for anyone's budget. Featuring high-efficiency MOSFET power supplies, flexible on-board crossovers, and state-of-the-art audio design, Directed Audio amplifiers will satisfy every music lover's needs for years to come. Your Directed Audio power amplifier comes with a two year limited warranty if it is installed by an authorized DEI dealer. Amplifiers not installed by an authorized Directed dealer are covered are covered by a one year parts-and-labor limited warranty. Please save your sales receipt and refer to the warranty section of this manual for complete details.

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WARNING

High-powered car audio systems may produce sound pressure levels that exceed the threshold at which hearing loss may result. They may also impair a driver's ability to hear traffic sounds or emergency vehicles. Use common sense and practice safe listening habits when listening to or adjusting your audio system.

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INSTALLATION GUIDELINES

1. Please read the owner's manual carefully before you install the amplifier.
2. Disconnect the battery ground terminal prior to making any electrical connections.
3. Check for any hazards or obstructions such as gas tanks, fuel or brake lines, and wiring harnesses before mounting the amplifiers.
4. Pick a mounting location that will provide adequate access and ventilation and protect the amplifier from heat, moisture, and dirt.
5. Avoid sharp metal areas when routing cables to the amplifier, and run RCA cables away from the power cables and other potentially noisy car harnesses.
6. The amplifier should be grounded with a short, heavy gauge wire connected directly to the car at a bare metal surface. Make sure that the metal area is part of the car chassis or frame, not a separate part with poor electrical connection to the chassis.
7. Always fuse your power connection at the battery within 8-10 inches of the battery terminal. Use a fuse or circuit breaker rated at about 5-10 more amps than the on board fuse(s) of the amplifier(s). The gauge of power wire used should take into account the total current draw of the system, and the length of wire used. IASCA and other autosound competition organizations have charts available for this; you can also find a chart in the MECP study guide. Minimum wire gauge recommendations for the individual amplifiers are listed on the specification page. It is a good idea to use the same gauge wire for the amplifier ground that you use for the power wire. Be sure to examine the battery ground cable of the vehicle and upgrade it to a gauge of wire that can accommodate the extra load created by your amplifier installation. Remember, the amplifier can only deliver its rated output when it is not current limited by the power and ground supply wires.
8. This amplifier is designed to drive a speaker load that measures from 2-4 ohms. Keep in mind that heat is the long-term enemy of automotive electronics and that the lower your speaker load, the more heat

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is generated. For low impedance speaker applications or restricted ventilation installations, an external cooling fan may be advisable.

9. Your connections to the amplifier's speaker and power terminals should be made with crimped spade lugs, and the battery and ground connections to the vehicle should be made with crimped ring terminals of the appropriate size (surface area is what counts); soldering the terminals after crimping is also recommended.
10. Due to the high-frequency MOSFET switching power supply used in all Directed Audio amplifiers, filtering the power cable is not generally required (remember that the amp can't deliver full output if the power supply is restricted). Proper grounding of the signal source is mandatory for the amplifier to reach its performance peak. If the RCA inputs are not grounded adequately via the signal source, electrical noise from the vehicle may be picked up in the system.

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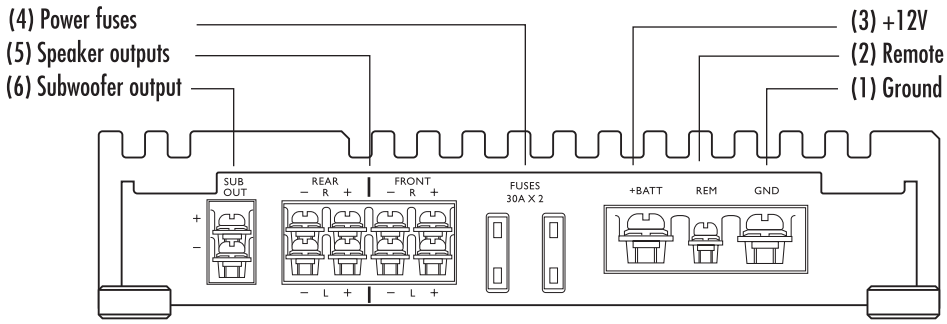
AMPLIFIER CONNECTIONS

Refer to Figure 1 for details.

1. **GROUND TERMINAL** - connect this terminal to the car chassis with a short heavy gauge wire, DO NOT CONNECT TO THE NEGATIVE TERMINAL OF THE CAR BATTERY or to factory chassis ground points already occupied by factory wires! If you are grounding multiple amplifiers, you may use a high-current distribution block with proper gauge cables, or use individual grounds for each amp attached to the vehicle at separate but close ground points.
2. **REMOTE TERMINAL** - connect this terminal to the amplifier remote output from your head unit or signal source or power antenna output wire from decks that do not have separate amp remote outputs. Do not connect this terminal to a constant source of +12V.
3. **+12V POWER TERMINAL** - connect this terminal to the positive terminal of the car or separate audio system battery. Refer to the installation guidelines and specs page for proper gauge of wire. YOU MUST PROTECT THIS WIRE WITH A FUSE or circuit breaker located close to the battery.
4. **POWER FUSES** - protects the amplifier against electrical damage. DO NOT REPLACE THE FUSES WITH LARGER AMPERAGE FUSES ! If the fuses blow, check your system for wiring problems or see your dealer.
5. **SPEAKER OUTPUT TERMINALS** - Refer to the speaker wiring diagrams (pg.6) for different wiring options.
6. **SUBWOOFER OUTPUT** - connect the subwoofer to these terminals.

FIGURE 1—AMPLIFIER CONNECTIONS



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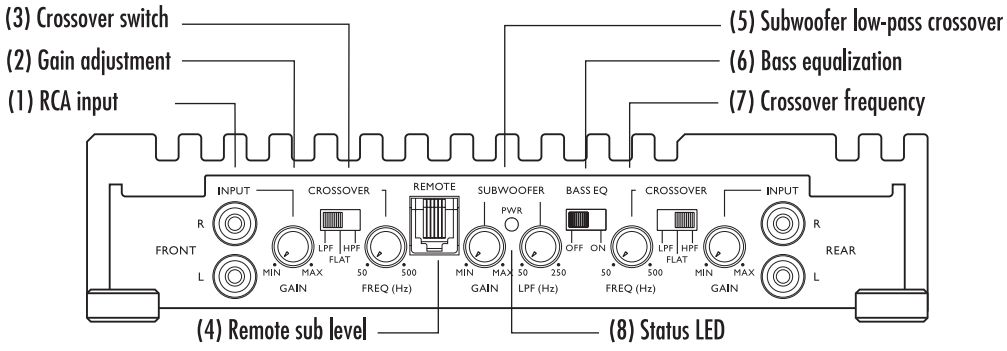
AMPLIFIER CONTROLS

Refer to Figure 2 for details.

1. **RCA INPUT JACKS** - accepts line-level outputs from head units or signal sources at voltages from 200mV to 8 volts.
2. **GAIN ADJUSTMENT** - controls the gain (input sensitivity) of the amplifier. Each control sets the gain for that half of the amplifier.
3. **CROSSOVER SELECTION SWITCH** - controls the type of filter for each of two on-board active crossovers. Set crossover switches for proper filter type depending on system configuration.
4. **REMOTE SUB LEVEL** - controls the subwoofer output level
5. **SUBWOOFER LOW-PASS CROSSOVER** - use the gain and crossover frequency controls to adjust the subwoofer output.
6. **BASS EQ** - This switch activates an 8dB bass boost circuit. Use as necessary for low frequency enhancement.
7. **CROSSOVER FREQUENCY** - controls the frequency range of the amplifier. Each half of the amplifier can be set independently for optimum performance.
8. **LED INDICATOR** - the green Power LED lights to indicate normal operation. The green LED will shut off to indicate amp shutdown due to thermal, short circuit, DC offset, or over-current conditions detected by on-board protection circuits.

FIGURE 2—AMPLIFIER CONTROLS



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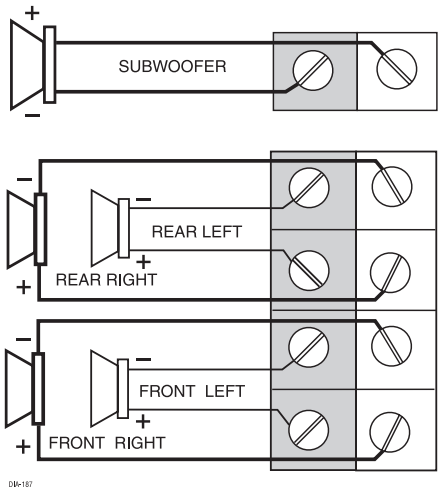
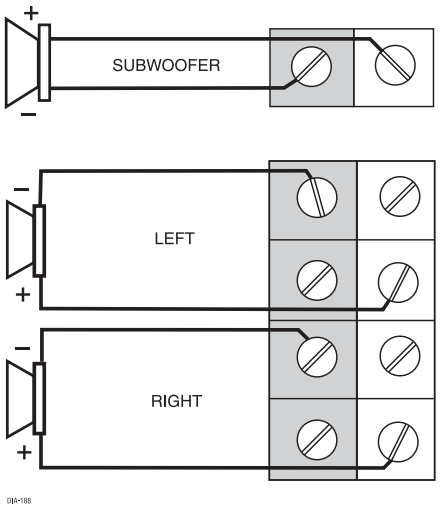
SPEAKER WIRING DIAGRAMS

Five channel operation



Three channel operation



For bridged three channel operation as shown in this diagram, connect right channel RCA cables to the "FRONT" inputs of the amplifier, and left channel RCA cables to the "REAR" inputs of the amplifier.

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CROSSOVER SETTINGS AND GAIN ADJUSTMENT

Your Directed Audio power amplifier needs to be adjusted carefully to achieve maximum performance. These are some guidelines to follow when fine-tuning the amplifier.

- For normal complete system applications, the crossover selection switches should be set to "HPF".
- The crossover frequency controls need to be adjusted to suit your particular system. For subwoofer applications, try and keep the setting low enough to prevent image smearing (you should not be able to hear male voices from the subwoofer) but not so low as to create a gap between the subwoofer and the mid-bass/midrange speakers. For mid-bass/midrange settings, try to keep the frequency low enough to keep your sound stage in front of you, without overdriving the speaker. It will be to your advantage to spend some extra time with these adjustments, listening to familiar music or system set-up discs to achieve the kind of musical reproduction that you prefer.
- The gain adjustments allow you to set proper signal match for clean, quiet amplifier operation. For full-range and simultaneous stereo/mono bass applications, start by playing some music you are familiar with. With the gain adjustments on the amplifier in the middle of their rotation, bring up the volume on your head unit to the 3/4 volume setting or until you start to hear distortion or clipping. If you hear distortion before you reach the 3/4 volume setting of your head unit, reduce the gain settings on the amplifier and start to raise the head unit volume again. When you can listen to the music at or slightly above 3/4 on your head unit without audible distortion, slowly raise the gain of the amplifier until distortion is heard, then back off the gain until the distortion is not audible. This setting will allow you to reach full output with all but the quietest of source material, while avoiding excessive noise in the system. You may need to set the rear channels gain control lower to maintain a good sound stage.
- The same procedure should be used for adjusting the amplifier when the on board crossover is set to LPF or FLAT, but you will also have to take into consideration the effect that gain adjustment has on system frequency response and imaging. Again, plan on spending some time with music that you know getting the gain and crossover settings the way you like. Test discs and analyzers may help with this process, but in the end it's your ears that count - listen to the music !

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SPECIFICATIONS

	ch 1-4	ch 5
RMS continuous power per channel,Channels 1-4 driven into 4 ohms from 20 to 20,000 Hz, with less than 0.08% total Harmonic Distortion @ 14.4 VDC. Channel 5 driven into 4 ohms from 20-250 Hz, with less than 0.08% THD @ 14.4 VDC.	50 watts	250 watts
RMS continuous power per channel,Channels 1-4 driven into 2 ohms from 20 to 20,000 Hz, with less than 0.1% Total Harmonic Distortion @ 14.4 VDC. Channel 5 driven into 2 ohms from 20-250 Hz, with less than 0.1% THD @ 14.4 VDC.	75 watts	350 watts
RMS continuous power, 3-channel operation, channels 1-4 bridged into 4 ohms from 20 to 20,000 Hz, with less than 0.1% Total Harmonic Distortion @ 14.4 VDC. Channel 5 driven into 2 ohms from 20-250 Hz, with less than 0.1% THD @ 14.4 VDC.	150x2 watts	350 watts
Dynamic power rating (IHF-202 Standard) at minimum load	800 watts	

Signal-to-Noise Ratio	Greater than 95 dB
Frequency Response	20-20,000 Hz ± 0.5 dB
Damping Factor @ 4 ohm	Greater than 200
Crossover	Switchable high or low pass 12 dB/octave, continuously variable 50 to 500 Hz
Subwoofer Crossover	Low pass 12 dB/octave, variable 50 to 250Hz
Bass Equalization	+8 dB, centered at 40Hz
Input Impedance	20K ohms
Input Sensitivity	Variable from 150 mV to 8 volt
Output Impedance (ch 1-4)	2 to 8 ohms, stereo 4 to 8 ohms, bridged
(ch 5)	2 to 4 ohms
Supply Voltage	10 to 16 VDC
Fusing and Power Cable Requirements (AWG) (Per amp, trunk mounted)	60A #8

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LIMITED TWO YEAR CONSUMER WARRANTY

Directed Electronics, Inc. (DEI®) promises to the original purchaser, to replace this product should it prove to be defective in workmanship or material under normal use, for a period of two years from the date of purchase by the dealer as indicated by the date code marking of the product **PROVIDED** the product was installed by an authorized DEI dealer. During this two year period, there will be no charge for this replacement **PROVIDED** the unit is returned to DEI, shipping pre-paid. If the unit is installed by anyone other than an authorized DEI dealer, the warranty period will be 1 year from date of purchase by the dealer as indicated by the date code marking of the product. During this 1 year period, there will be no charge for this replacement **PROVIDED** the unit is returned to DEI, shipping pre-paid. This warranty is non-transferable and does not apply to any unit that has been modified or used in a manner contrary to its intended purpose, and does not cover damage to the unit caused by installation or removal of the unit. This warranty is void if the product has been damaged by accident or unreasonable use, neglect, improper service or other causes not arising out of defects in materials or construction. **ALL WARRANTIES INCLUDING BUT NOT LIMITED TO EXPRESS WARRANTY, IMPLIED WARRANTY, WARRANTY OF MERCHANTABILITY, FITNESS FOR PARTICULAR PURPOSE, AND WARRANTY OF NON-INFRINGEMENT OF INTELLECTUAL PROPERTY ARE EXPRESSLY EXCLUDED TO THE MAXIMUM EXTENT ALLOWED BY LAW, AND DEI NEITHER ASSUMES NOR AUTHORIZES ANY PERSON TO ASSUME FOR IT ANY LIABILITY IN CONNECTION WITH THE SALE OF THE PRODUCT. DEI HAS ABSOLUTELY NO LIABILITY FOR ANY AND ALL ACTS OF THIRD PARTIES INCLUDING ITS AUTHORIZED DEALERS OR INSTALLERS.** Unit must be returned to DEI, postage pre-paid, with: consumer's name, telephone number, and address, authorized dealer's name and address, and product description. **IN ORDER FOR THIS WARRANTY TO BE VALID, YOUR UNIT MUST BE SHIPPED WITH PROOF OF INSTALLATION BY AN AUTHORIZED DEI DEALER. ALL UNITS RECEIVED BY DEI FOR WARRANTY REPAIR WITHOUT PROOF OF DEI DEALER INSTALLATION WILL BE COVERED BY THE LIMITED 1 YEAR PARTS AND LABOR WARRANTY. Note:** This warranty does not cover labor costs for the removal and reinstallation of the unit. **BY PURCHASING THIS PRODUCT, THE CONSUMER AGREES AND CONSENTS THAT ALL DISPUTES BETWEEN THE CONSUMER AND DEI SHALL BE RESOLVED IN ACCORDANCE WITH CALIFORNIA LAWS IN SAN-DIEGO COUNTY, CALIFORNIA.**

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OTHER PRODUCTS AVAILABLE FROM:

Directed® AUDIO

Directed®

- CLASS D MONO AMPLIFIERS
- 2 CHANNEL AMPLIFIERS
- 4 AND 5 CHANNEL AMPLIFIERS
- SIGNAL PROCESSORS

Directed Pro

- TUBE SUBWOOFERS
- POWERED SUBWOOFERS
- SINGLE AND DUAL VOICE COIL SUBWOOFERS
- COAXIAL SPEAKERS

Pro Plus

- SINGLE AND DUAL VOICE COIL SUBWOOFERS
- COAXIAL SPEAKERS
- COMPONENT SPEAKER SYSTEMS

Studio

- SINGLE AND DUAL VOICE COIL DIE-CAST SUBWOOFERS
- COMPONENT NEODYMIUM SPEAKER SYSTEMS

Competition

- SINGLE AND DUAL VOICE COIL DIE-CAST SUBWOOFERS

DIRECT CONNECTION

- HIGH PERFORMANCE POWER CABLES
- PREMIUM SPEAKER/AUDIO CABLES AND ADAPTERS
- POWER CAPACITORS
- GOLD-PLATED POWER DISTRIBUTION AND FUSING BLOCKS
- GOLD-PLATED POWER AND SPEAKER TERMINALS

ISO 9001

DEI is an ISO 9001 registered company.

Always use a MECP certified professional

DEI is a proud member of IASCA

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